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### ON THE DIMENSIONS OF THE UNIVERSE.

The earth which we inhabit is known to be about twenty-five thousand miles in circumference, or eight thousand in diameter. Of a magnitude so immense, it is difficult to form even a faint conception. A comparison with any object on the earth's surface, of known dimensions, will probably fail to assist us; but let us make the attempt.—The largest of the pyramids of Egypt has a base of six hundred and eighty-two feet square, and is five hundred and twenty feet in height. According to Pliny, it occupied an army of workmen, more than three hundred thousand in number, twenty years in its construction. Now it is easy to show that the earth is five hundred quadrillions of times greater than this huge mass; or as much greater, as the pyramid itself is greater than a grain of wheat. Yet the earth is by no means the largest of the planets. Saturn exceeds it a thousand, and Jupiter more than thirteen hundred times; and all dwindle into insignificance when compared with the Sun, of which the volume is nearly a million and a half times greater than that of the earth, and more than three hundred times greater than that of all the planets put together. The diameter of the body of the sun is double that of the moon's orbit around the earth; so that if a sphere surrounded us at this great distance, it would have but one eighth of the magnitude of the sun. This gives us the conception of an immense mass; but yet it is wholly inadequate, for our judgment of the distance of the sky, in which we imagine the moon to be placed, is very erroneous, and falls far short of the truth.

Such are the magnitudes of the bodies composing our system. Their distances and motions present us with subjects no less worthy of our contemplation, and equally calculated to excite our astonishment.

The huge globe of the earth is known to revolve around its axis in twenty-four hours; so that every point in the equator has a velocity of rotation of more than a thousand miles in an hour. But this is a tardy pace in comparison with the speed with which the earth is transported through space in its annual orbit, and which amounts to no less than nineteen miles in a second. It is easy to name this velocity, but very hard to conceive it. It is sixty times greater than that with which the ball is shot from a musket, and twelve hundred times greater than the speed of the swiftest race horse.

The distances of the planets from the sun, are also difficult of conception. That of the earth is estimated at ninety-five millions of miles. It would occupy more than one hundred and eighty years to pass over it, at the rate of a mile in a minute, continued without interruption. The orbit which the earth traverses annually, is about three hundred millions of miles in length; and, at the imaginary speed which we have named, would take eleven hundred and thirty-seven years to travel it: at any rate of travelling actually practised, it would occupy a period longer than that which has elapsed from the Mosaic creation to the present day. The distance and the orbit of the planet Herschel, are nearly twenty times greater than those of the earth.

Let us now leave the solar system, to which we belong, and extend our views beyond its limits; for vast and wide as we

have found them to be, the created universe is by no means confined to these boundaries.

When we look upon the heavens, on a clear night, the fixed stars presented to our view seem to form a countless multitude. But our impression deceives us. The number visible to the naked eye, at any one time, even under the most favorable circumstances, does not exceed two thousand; and of these, there are but about eleven of the first, fifty of the second, and one hundred and twenty of the third magnitude. If, however, we call the powers of the telescope in aid of our vision, we shall find that our first impression, with regard to the number of the stars, has to be resumed. Dr. Herschel having directed his great telescope toward the milky way, observed five hundred and eighty-eight stars in the field of view, at the same time, and they continued equally numerous, as they passed on before him, for a quarter of an hour. In a band ten degrees long and two and a half wide, he computed that there were no less than two hundred and fifty-eight thousand stars. But, besides the milky way, there are bright spaces observed in every part of the heavens, resembling white summer clouds, and called *nebulæ*. Some of these are visible to the naked eye; some are seen only by the aid of colossal telescopes. Dr. Herschel discovered above two thousand. The telescope separates some of these into distinct stars, while some still keep the appearance of uniform and continuous matter. If they are all to be considered as groups of stars, we must conclude that the number of these luminaries is, for us, indeed infinite.

It is highly interesting for us next to inquire into the distances of the stars, and the portions of unlimited space which they occupy: but the inquiry presents great difficulties. By a process familiar to astronomers, we can determine the angle under which the globe of the earth would be seen from the sun, moon, and planets, and, as we know the dimensions of the earth, we can thence determine the distances of these bodies. But this method utterly fails for the fixed stars, the angle in question, being too small to be measured, or even at all perceived. Astronomers have accordingly had recourse to another method which is much more promising. By observations made at opposite periods of the year, we may determine the angle under which the orbit of the earth itself would be seen from a distant heavenly body, and thus we might solve the problem. But, to our astonishment, we find that even this angle is so small, as to leave us in doubt whether it is in any case measurable. Dr. Bradley supposed that he had found it equal to two seconds, for *γ Draconis*; which would make the distance of this star two hundred thousand times greater than that of the sun. But Pond and Brinckley found no *annual parallax* in this star. Dr. Brinckley thought he had discovered a sensible parallax in several stars; but his observations were carefully repeated by Mr. Pond, the British astronomer royal, and were not confirmed. On the whole, we must conclude that the annual parallax of the fixed stars is not appreciable by our astronomical instruments, notwithstanding the great perfection to which they have been brought. We may indeed safely affirm, that, for the brightest of the stars, it does not amount to one second; that is to say, that from the nearest of these luminaries, the diameter of the earth's orbit, which is a line of nearly two hundred millions of miles in length, would be seen under a visual angle of less than a second.

What then must be the distance of these bodies?—We have already put our imaginations on the stretch, to conceive the vast spaces in the solar system, and have perhaps failed in the effort. How then are we to be led to a proper conception of the immense distances that separate us from the fixed stars? We have seen that the diameter of the earth's orbit, which, with regard to the spaces most familiar to us, is itself almost infinite, will not serve even as a *measure* for the sublime distances which we are now called upon to contemplate. We must have recourse to a new unit, and one is presented to us in the spaces traversed by light. From the eclipses of Jupiter's Satellites, and the phenomenon of aberration, we know that light moves with the almost unimaginable velocity of two hundred thousand miles in a second. Yet it can be shown that light cannot take less than *three years*, to come to us from the nearest stars of our system. But there is every reason to suppose that the

stars are as distant from one another as the nearest is from us; in what points of infinite space, then, are the farthest of them situated? May not the ray by which we now see them have left them thousands of years ago? New stars have been sometimes presented to the view of astronomers, where none had before existed. May it not be, that the light which left them at their creation, then first reached the earth? Dr. Herschel conjectured that the distances of the stars were nearly in an inverse ratio to their apparent magnitudes, and he thence concludes, that the faintest nebulæ discoverable by his forty-feet telescope, and the stars of which he considers as of the 1342d magnitude, are at such a distance, that the light issuing from them must have been two millions of years in reaching our earth. Before we reject this mighty conception as absurd, we must reflect that it comes from a calm philosopher, long familiar with the contemplation of the heavens; we must reflect, too, that it is not for us to settle the boundaries of creation. But if these sublime conjectures be founded, what are we? The earth which we inhabit is a point, and the period which includes the whole annals of mankind is is but a moment.

We have now attempted to consider the number and distances of the fixed stars. If we ask what is the nature of those bodies, all analogy seems to point to the answer, that they are *suns*, and, if so, that they are, in all probability, centres about which, as in the solar system, worlds continually circulate, inhabited, like our earth, by living and perhaps rational beings.

A careful examination of the heavens leads to the conclusion, first drawn by Herschel, that the stars are all disposed in groups or clusters, separated from each other by immense spaces, and of which the nebulæ are examples. But if this supposition be correct, our sun should itself belong to such a nebula. Herschel accordingly supposes that it does so, and that this nebula is the cloud of stars which constitutes the galaxy or milky way. All the single stars which we observe belong to this group, which is supposed to be of a flat form, much more extended in length and breadth, than in thickness.—The conjecture seems full of plausibility; although it stretches our conceptions of the magnitude of the universe, so as to give pain to the imagination.

In the course of these contemplations, we have seen that the largest structure of human art and labour dwindled to a point when compared with the huge mass of the earth;—we have seen the earth itself falling into insignificance when compared to the solar system;—we have seen this *system* shrinking into an atom, as we passed into unlimited space, and viewed the numberless nebulæ, of which the galaxy is one, each nebula composed of myriads of stars, and each star a sun, and the centre of a system.—There yet remains a subject of contemplation to which the universe itself must yield in magnificence and sublimity. It is that infinite being who created this universe,—who gave the eternal laws by which it is governed,—and who now upholds and directs it. M.

## JEFFERSONIANA, No. 7.

### DENMARK.

All Europe was beholden to the northern nations for introducing or restoring a constitution of government far excelling all others that we know of in the world. It is to the antient inhabitants of these countries, with other neighboring provinces that we owe the original of parliaments, formerly so common, but lost within this last age in all kingdoms but those of Poland, Great Britain and Ireland. Denmark was till 1660 governed by a king chosen by the people of all sorts; even the boors had their voices, which king Waldemar the third acknowleged in that memorable answer of his to the pope's nuncio, who pretended to a great power over him; "Naturam habemus a deo; regnum a subditis, divitias a parentibus, religionem a Romana ecclesia; quam si nobis invides, renunciamus per praesentes." The estates of the realm being convened to that intent were to elect for their prince such a person as to them appeared personable, valiant, just, merciful, affable, a maintainer of the laws, a lover of the people, prudent, and adorned with all other virtues fit for government, and requisite for the great trust reposed in him; yet with due re-

gard had to the family of the preceding kings. If within that line they found a person thus qualified or esteemed to be so, they thought it but a piece of just gratitude to prefer him before any other to this high dignity; and were pleased when they had reason to choose the eldest son of their former king, rather than any of the younger, as well because they had regard to priority of birth, when all other virtues were equal, as because the greatness of his paternal estate might put him above the reach of temptations to be covetous or dishonest and enable him in some degree to support the dignity of his office. But if after such a choice they found themselves mistaken, and that they had advanced a cruel, vicious, tyrannical, covetous, or wasteful person, they frequently deposed him, oftentimes banished, sometimes destroyed him; and this either formally, by making him answer before the representative body of the people; or if by ill practices such as making of parties, levying of soldiers, contracting of alliances to support himself in opposition to the people's rights, he was grown too powerful to be legally contended with, they dispatched him, without any more ceremony, the best way they could, and elected presently a better man in his room; sometimes the next of kin to him, sometimes the valiant man that had exposed himself so far as to undertake the expulsion or the killing of the tyrant; at othertimes a private person of good reputation who possibly least dreamt of such an advancement. Molesw' account of Denwark c. 4.

This was the antient and is the present constitution of Sweden; as it is also of Poland in some measure; and it may certainly be deemed the present constitution of Great Britain. Acts of Parliament have indeed been passed for settling the succession; but they are void in their nature; because a king, *elected by the people*, is one of the branches to whom the people have deputed the power of making laws; and they have never bound themselves to submit to any laws but such as have received the approbation of the Commons, the Lords, and a king so elected. And this being a merely delegated power, cannot be deputed to others by the whole delegates, much less by two branches of them only, to wit the Lords and Commons. Locke Gov. 2. 11. The following exercises of the right of electing a king by the people of England prove such a right reserved to them.

640. Ercombert succeeded Eadbald his father in the kingdom of Kent to the exclusion of Erminfrid his elder brother.

673. Lothaire, brother to Egbert the late king of Kent, was placed on the throne to the exclusion of Edric his son.

684. Edric slew Lothaire and became king to the exclusion of Richard, son of Lothaire.

Ceorl a kinsman of Wibba, last king of Mercia, was made king, and excluded Penda, the son of Wibba.

672. Sexburga, widow of Kenwalch king of Wessex continued in the government till her death, though there were relations.

726. Adelard, brother to Ethelburga wife of Ina, king of Wessex, succeeded to the throne (to which he was called by the will of Ina) to the exclusion of Cuthburga and Quenburga—sisters of Ina and of Oswald who was of the royal family.

Cenulph was elected by the people of Wessex, they having first dethroned and expelled Sigebert for mal-administration.

784. Brithric a remote descendant of the royal family was preferred to Egbert the great grandson of Ina by his brother Ingild.

Innumerable other instances might be produced from the history of the Heptarchy, but I will pass on to times after the union.

925. Athelstan, natural son of Edward the elder, succeeded to the exclusion of Edward's legitimate children who were younger.

946. Edred, brother of Edmund, succeeded in preference to the sons of Edmund.

955. Edwy, son of Edmund, succeeded, again setting aside the sons of Edred the last king.

1017. Canute the Dane became king on the death of Edmund Ironside—the Saxon line being set aside.

1035. Harold, second son of Canute, succeeded in preference to Sweyn his elder son, King of Norway.

1059. Hardicanute, third son of Canute, succeeded to the exclusion of the same Sweyn.

1041. Edward (the confessor), son of Ethelred by a second marriage, was advanced to the throne in preference to the same Sweyn, and also to the descendants of Edmond Ironside, who was son of Ethelred by his first marriage.

1066. Harold succeeded Edward the Confessor by universal consent, excluding Edgar Atheling, son of Edward who was son of Edmond Ironside—elder brother of Edward the Confessor.

From these instances it appears the crown of England was neither hereditary nor testimentary, though both of these circumstances gave weight in the election of a successor.

1066. William the Norman excluded Edgar Atheling.

1086. William Rufus, second son of William the Norman, succeeded to the exclusion of Robert—the eldest son.

1100. Henry I. succeeded William II, in exclusion of the same Robert.

Stephen, son of Adela, who was a daughter of William the Norman (by Stephen Count of Blois) succeeded Henry in preference to Matilda, Henry's daughter (married to the Emperor of Germany.)

1154. Henry the second, son of Matilda, succeeded to Stephen in preference to William, son of Stephen.

1326. Edward III, called to the throne in the room of his father Edward II, who was deposed.

1399. Henry IV, (Bolingbroke), Duke of Lancaster, placed on the throne instead of Richard II. deposed, and in preference to the house of York who were descended from Duke of Clarence, second son of Edward III, while the house of Lancaster was descended from John Earl of Gaunt, third son of Edward III. The crown was continued in the line of Lancaster through three successive reigns, to wit Henry IV., Henry V., Henry VI., when it was given to

1461. Edward IV. of the house of York.

1483. Richard III. (Duke of Gloster) was elected in the room of Edward V., deposed.

Richard was of the family of York, but not heir.

1485. Henry VII., (Earl of Richmond) came next to the throne, and was descended from John of Gaunt—Duke of Lancaster—who during the life of his second wife lived in adultery with Catharine Swineford, by whom he had issue John Beaufort—Earl of Somerset, who had a son, John Duke of Somerset, who had a daughter, Margaret, intermarried with Edmond Tudor, Earl of Richmond, by whom she had Henry VII, so that he was of the house of Lancaster, which was a junior house, and was of an illegitimate branch of that house. Moreover his mother was still living and stood before him, if regular succession had been regarded. But he mended his title by marrying Elizabeth, eldest daughter of Edward IV. and heir to the crown.

1688. Mary, eldest daughter of James II, with her consort, William Henry Nassau prince of Orange called to the throne in the room of her father who was deposed.

1695. William III., on the death of Mary continued on the throne in preference to James II, then living and also to the lady Anne, second daughter of James II.

1702. Anne succeeded to the prejudice of her brother.

1714. George I., son of Ernest Augustus, elector of Brunswick, by Sophia granddaughter of James I., succeeded to the exclusion of the male descendants of James II.

1727. George II., succeeded in like manner.

1760. George III., in like manner.

That acts limiting the succession of the crown are of little consequence appears by the succession of James I. to the exclusion of the descendants of lady Jane Grey who, on failure of issue of Henry VIII., was by his will called to the crown (she

being daughter of his second sister, while the elder sister had married the king of Scots and left issue James I.) he having a power of limiting the succession as he pleased by an act of Parliament. Yet Jac. I. succeeded without any opposition of note.

Frequent meetings of the estates was a part of the fundamental constitution of Denmark. In these, all matters relating to good government were transacted, laws enacted, peace, war, alliances, disposal of great offices, marriages of the royal family &c. were debated. Taxes and benevolences were purely accidental, no constant tribute being paid nor money levied on the people, unless to maintain a necessary war with the advice of the nation, or now and then a free gift towards a daughter's portion. The king's ordinary revenue consisted in his lands, on which he lived like one of our modern noblemen. This form of government continued till 1660, when in one instantt he whole face of affairs was changed, the kings rendered perfectly absolute, and not the smallest remnant of liberty left to the subject. It happened thus. The nation was at that time reduced very low by the late wars with the Swedes, the army not disbanded, nor money to discharge the arrears due to them in order to disband them. The states were called at Copenhagen,—to wit, the nobility, the commonalty, and the clergy. The nobility were for maintaining and even extending their antient prerogative of paying nothing by way of tax, but only by voluntary contribution. On the other hand the clergy for their late adherence to the interests of their country, and the Burghers for their vigorous exertions, thought themselves entitled to some new merit of the state, and that the sums of money necessary should be levied proportionably, the nobility, who enjoyed all the lands, paying their share of the taxes. The dispute growing very warm, the Commons and Clergy went in a body to the palace and presented the king with the absolute and hereditary dominion of their state; with which the nobles were obliged to concur. Thus was the kingdom of Denmark changed from an estate little differing from an aristocracy into an absolute monarchy in four days time, without the smallest attempt at opposition. And at this time (1692) all meetings of the estates in parliament are entirely abolished, and the very name of estates and liberty as much forgotten as if there never had been any such thing among them. Lord Molesw' Acct. Denm. c. 6. 7. The laws of Denmark for justice, brevity, and perspicuity are excellent. They are grounded on equity, are contained in one quarto volume, and written with so much plainness, that any man who can write and read may presently understand his own case and plead it too without the help of counsel. ibid. c. 15. Corruptissima republica plurimæ leges. Tacit. Ann. Lib. 3.

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SONNET TO E. B. Esq.

*On the death of the amiable and beautiful Miss L. M. to whom he was about to be united.*

Thy destin'd bride swept off in beauty's bloom,
Young, fair and excellent, thy soul defies
All future ills; and thy affection lies
Low with the lovely tenant of the tomb:
But HE who gave may sure his gifts resume,
And none dare murmur. Lift not thus thine eyes
And voice reproachfully to yonder skies,
Upbraiding heaven with too severe a doom:
Thou *hast been* happy: thou hast known the bliss
Of mutual hearts, and thou didst never feel
Neglect's all blasting frost, which doth dismiss
From out the breast not love, but life; his seal
Thus stampt by death on breathing clay; Oh! this
Is wretchedness nor time nor skill can heal.

P. C. T.

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## LANGUAGES OF EUROPE.

The European part of the old world is properly but a continuation of the Asiatic—in other words the two are continuous. There is no positive line of demarcation, no sea which acts as a separating yet connecting link between them. The word *Europe* or *Europa* is Phœnician, but we know not what countries the Phœnicians comprehended under the title, —certainly not the extensive regions situated to the northward of Prussia, for

with them they were probably totally unacquainted. At a much later period, indeed, of history these were known only by obscure report. They formed what the Germans call a *Nebellande*,—a mazy region regarding which all was obscurity, ignorance and superstition. The Ural mountains may perhaps be fairly taken as a geographical division between these two divisions of the globe.

To Asia, Europe was doubtless indebted for its inhabitants. In a former number of this miscellany reasons were assigned for placing the cradle of mankind in middle Asia, in the beautiful and elevated district and in the neighbourhood of the extensive mountain ridges to which allusion was made in the article alluded to. From thence the different nations spread abroad to the north and the south, to the east and the west; Europe being peopled by the migratory hordes which proceeded towards the northwest and Africa by those from southwestern Asia. These migrations probably all occurred by land, except in the case of America where a slight sea voyage across Behring's Straits, even in frail vessels, would be sufficient to transport the emigrants without much risk of shipwreck or other disaster. Europe probably received its earliest inhabitants long before navigation had occurred to any extent.—Subsequently, when a coasting trade was established—to which the enterprise of the nations would at first be limited, until by improved vessels and a better system of management they were enabled to brave the terrors of the Ocean and undertake their adventurous voyages of discovery —we know that many of the coasts, of the Mediterranean particularly, received swarms of emigrants, and this accounts for the motley population observable at an early period in these regions. Carthage we know was settled by the Phœnicians, and southern Italy and Sicily, in this manner, received their Greek Colonists.

That the period of the first peopling of the European countries must have occurred very early is evidenced by the fact, that at the very dawn of history the whole of Europe from the Don to the mouth of the Tagus, was filled with nations of various physical characters and languages with striking marks of intermixture and modification. At this period there were in Europe at least six great nations.

1. The *Iberians* with the *Cantabri*, in Spain, in a part of Gaul, and on the coasts of the Mediterranean as far as Italy.

2. The *Kelts* in Gaul, the British Isles, between the Danube, and the Alps, and in a part of Italy.

3. The *Germani or Goths* between the Rhine, the Danube and the Vistula far into the north.

4. The *Thracians* with the *Illyrians* in the southeast of Europe, and in western Asia.

5. The *Slavi* in the north of Europe.

6. The Fins in the north east of Europe.

It is not improbable but these different nations or tribes migrated in the order which we have mentioned: such is Adelung's theory, and there is some reason for adopting it.

They who migrated first would probably extend their wanderings until arrested by some invincible obstacle: or, the arrival of fresh tribes would drive them onwards farther and farther towards the west. Hence they would ultimately reach the ocean which would effectually arrest their farther progress, unless towards the south and the north.

The descendants of the antient Iberians do now actually occupy the west of Spain, the residence probably of their forefathers.

About the same time, perhaps, the Kelts, a populous tribe, migrated from Asia and occupied a considerable portion of middle Europe. To these succeeded the Germans to the north and the Thracians to the south; whilst the Slavi, the last of the Asiatic emigrants, took possession of the north.

It is not easy to determine the link occupied by the Fins in this great chain of nations. They were first known to

history as a peculiar people in the north of Europe, but whence they proceeded, or whether they occupied their position to the north of the Germani from choice, or were urged onwards by their more powerful neighbours, we know not.

So long as there was sufficient space for the nations to occupy without disturbing the possessions of their neighbours, they kept themselves entirely distinct; but, so soon as the land was filled, a contest arose for the possession of greater or more eligible regions; wars were consequently undertaken and the weaker gradually yielded their possessions or their sovereignty to the stronger. Thus, at the very dawn of history, numerous nations were met with amalgamated both in blood and language—for example, the Kelto-Iberians of Spain, the Belgi or Kymbri of Gaul and Britain, the Latins, Etruscans and other nations of Italy, and probably many others existed whose manners, characters and language had become so melted into each other as to leave little or no trace of the predominant constituent. In more modern times the Letti, Wallachians, Hungarians and Albanians of eastern Europe afford us examples of such amalgamation; whilst the mighty Slavonic nation has swallowed up numbers of less powerful tribes and annihilated even their names forever.

This it is which frequently perplexes the philological historian; which prevents him, without other evidence, from deducing with accuracy the parent stock or the most important admixtures.

The following is a table of the great European Languages; including both these existing at the present day and those which were known in antiquity.

I. CANTABRIAN or BASK.

II. KELTIC.
- 1. ANTIENT KELTIC.
- 2. DAUGHTERS OF THE KELTIC IN THE BRITISH ISLES.
  - *a. Irish, Erse.*
  - *b. Mountain Scotch, Highland, Gaelic.*

III. KELTO-GERMANIC or KYMBRIC.
- 1. KYMBRIC OF WALES AND CORNWALL.
- 2. KYMBRIC OF LOWER BRETANY.

IV. GERMANIC.
- 1. GERMAN.
  - *a. Upper German.*
  - *b. Nether German.*
    - 1. Friesic.
      - a. Batavo-Friesic.
      - b. Kauchico-Friesic.
      - c. North Friesic.
    - 2. Netherlandish and Hollandish.
    - 3. Nether Saxon.
  - *c. Middle German.*
  - *d. High Dutch.*
- 2. SCANDINAVIAN.
  - *a. Danish.*
  - *b. Norwegian.*
  - *c. Icelandic.*
  - *d. Swedish.*
- 3. ENGLISH.

V. THRACIO-PELASGIC—GREEK & LATIN
- 1. THRACIO-ILLYRIAN.
  - *a (In Asia Minor.)*
    - 1. *Phrygian.*
    - 2. *Thynian and Bithynian.*
    - 3. *Henetian and Paphlagonian.*
    - 4. *Mysian and Trojan.*
    - 5. *Lydian.*
    - 6. *Carian.*
    - 7. *Lycian.*
  - *b. (In Europe.)*
    - 1. *Cimmerian.*
    - 2. *Taurian.*
    - 3. *Thracian in the narrowest sense.*
    - 4. *Dacian and Getan.*
    - 5. *Mœsian.*
    - 6. *Macedonian.*
    - 7. *Epirotic.*
    - 8. *Abantic.*
    - 9. *Illyrian.*
    - 10. *Venetian.*
    - 11. *Pannonian.*
- 2. PELASGIC.
  - 1. *Lelegic.*
  - 2. *Curetan.*
  - 3. *Dryopic.*
  - 4. *Thesprotic.*
  - 5. *Lapithic and Centaurian.*
  - 6. *Perrhebean.*
  - 7. *Telchitic.*
  - 8. *Ektenic, Hyantic and Æonean.*
  - 9. *Kaukonic.*
  - 10. *Tyrrhenic.*
  - 11. *Arcadian.*
  - 12. *Greek, Œnotrian.*
  - 13. *Cretan.*
- 3. HELLENICO-GREEK.
  - *Modern Greek.*

4. LATIN.
   1. *Latin.*
   2. *Daughters of the Latin.*
      a. Italian.
      b. Spanish and Portuguese.
         1. Spanish.
         2. Portuguese.
   3. *French.*
   4. *Romanic or Rhaetic.*

VI. SCLAVONIC.
1. ANTIC OR EASTERN.
   *a. Russian*
      1. Slavonico-Russian or Slavonico-Servian Church-language.
      2. Common Russian.
   *b. Illyrico-Slavonic.*
      1. Servian.
      2. Croatian.
      3. Southern Wendish or Windish.
2. WESTERN SLAVONIC.
   1. *Polish.*
   2. *Tscheschan* or *Bohemian.*
   3. *Servian.*
   4. *North Wendish.*

VII. GERMANICO-SLAVONIC or LETTISH.
1. OLD PRUSSIAN.
2. PRUSSO-LITHUANIAN.
3. POLNICO-LITHUANIAN.
4. LETTISH in the narrowest sense.

VIII. ROMISH-SLAVONIC or WALLACHIAN.

IX. TSCHUDISH.
1. FINNISH.
2. LAPONIC.
3. ESTHIAN.
4. LIEVAN.

X. MIXED LANGUAGES IN THE SOUTH EAST OF EUROPE.
1. HUNGARIAN.
2. ALBANIAN.

Ψ

## SONNET TO ——.

Enchantress from yon eastern clime afar!
Lovely beyond the daughters of the earth!
Like one thou seem'st to me of heavenly birth,
Enduring exile from thy native star:
Nor e'en in this HIS plan doth wisdom mar;
Intent her power to show in playful mirth
Alone on thee amidst the gen'ral dearth
Nature delights to shower rich gifts, which are
Enhanc'd by being thine; in thy sweet smile
Beauty, and grace and purity combin'd
Look like an angels attributes, and guile
Away the hearts of those, who gaze and find
Knowledge of things conceal'd from man ere while;
Enchantress fair, for this wert thou design'd!

D.C.T.

## RAILWAYS AND LOCOMOTIVE CARRIAGES.

Railways have been in use for more than a century, and are now very numerous, especially in England. The steam-engine has also been long employed for the conveyance of burdens upon these roads. But the railways have been, until very lately, limited in their use to mere local purposes, such as the transportation of coal and ore at the mines; and the clumsy engines, by which the loads were carried, have not moved at a rate exceeding three or four miles an hour. A new era has now commenced, as to both these important inventions. Railways have been constructed over long distances, and for general use; and the locomotive carriages have reached a degree of power and velocity, exceeding the most sanguine anticipations.

The Surrey Railway, in England, was the first constructed for the general accommodation of the public; but the only use as yet made of it has been for the conveyance of goods by horses, at a slow rate; and, as it passes through a country of little traffic, it has not fully answered the expectations of its projectors.

The second was the Stockton and Darlington Railway. On this, steam power was for the first time employed to propel passengers as well as goods, and with a degree of success which did not fail strongly to attract the public attention. It was here found, that, by the employment of steam carriages, a speed of from five to eight miles an hour, according to the weight drawn, might be readily attained, and at an expense of but one half or even one third of that required with horses. Inside passengers were conveyed for a penny-half-penny, and outsides for a penny a mile, and the price of coal, which used to be from 15 to 17*s* per ton at Stockton, was at once reduced to 10*s* 2*d*. In the second year after this railway went into operation, it had drawn to it the carrying trade between Stockton, Richmond, Darlington, Yarm, &c., although the turnpike-road, which, (to use the expression of the London Mechanics Magazine.

from which we have principally drawn this notice,) was thus "beaten out of the field," is actually four miles shorter than the railway.

But the last and most important of these works, in England, is the Liverpool and Manchester railway, which is indeed not yet entirely completed. It was commenced in the autumn of 1826, under the direction of Mr. George Stephenson, the engineer appointed by the company.

"The natural character of the country through which the road passes, made the undertaking one of considerable difficulty, as will be readily perceived from a simple detail of the work which Mr. Stephenson had to perform. There were, first, two tunnels, one 2200 yards, and the other 291 yards long, to be excavated under the town of Liverpool, and afterwards six considerable eminences to be cut through; these excavations too had mostly to be made through solid rock (red sandstone), and amounted altogether to upwards of two millions of cubic yards. While in some parts it was thus necessary to hew out a level with the pickaxe, there were others where the level had to be maintained by raising artificial mounds (or embankments as they are less properly called), bridges, and viaducts. One of these mounds, called the Broad Green Embankment, rises to an elevation of 70 feet above the level of the surrounding country; another, which is about four miles long, extends over a moss (Chatmoss) which three years ago was scarcely passable even to pedestrians. Of bridges and viaducts the number required to be erected on the line was 25; one of which (the Sankey) was to consist of nine arches of 50 feet span, and another (the Newton) of four arches of 30 feet span; besides which, there were to be 36 culverts of large dimensions, with several of a smaller size."

This great work is expected to be ready for travelling, through its whole extent, in the present season. Its length is 33 miles. The sort of rail used is that called the edge-rail, in contradistinction to the flat rail or tram plate, now generally abandoned where ease of draught is consulted. The total cost of this road is expected to be not less than three millions of dollars, or about 90 thousand dollars per mile. This great expense is attributed partly to the deep cuttings, lofty embankments, &c., and partly to the heavy compensation necessary to be made to the proprietors of the grounds through which it passes. Still, notwithstanding this great expenditure, and notwithstanding the railway will have excellent turnpike roads and the Irwell and Mersey navigation to contend with, a handsome income is so fully anticipated that the stock is considerably above par. Indeed the trafic between Liverpool and Manchester is probably as great as between any two points in Great Britian, or in the world. The one is the principal port for the importation of cotton, the other the chief seat of its manufacture. The quantity of merchandize passing between the two towns is estimated at no less thsn 1200 tons per day.

In this country, several very important railways are projected and in the course of execution. That intended to connect the Chesapeake and Ohio is the longest ever yet proposed, and is a work of national interest. The state of Pennsylvania is engaged in making a railway between the Susquehanna near Harrisburg, and the Schuylkill at Philadelphia. Another is nearly completed between the waters of the Susquehanna near Wilkesbarre, and those of the Hudson, intended principally for the purpose of supplying New York with coal. Another is to be constructed across the state of New Jersey, to connect the cities of New York and Philadelphia. The stock is subscribed for a rail road between Newcastle and Frenchtown, across the peninsula of Delaware, intended as a rival for that noble work the Chesapeake and Delaware canal.

The question of the relative merits of railways and canals, is one into the discussion of which we are not now disposed to enter, though it is naturally presented to our attention. It is ultimately to be decided, not by speculative arguments, but by the great experiments which are now making. In comparing their respective advantages, however, there is one particular in which the railways will no doubt have a great superiority, and that is in the greater rapidity of travelling over them. When a vessel is propelled through water, the resistance which it meets with from this medium is proportional nearly to the square of the velocity with which it moves; so that to double the velocity the moving force must be quadrupled, and to triple the velocity the power must be increased ninefold. Hence there is a limit to the possible speed, which, in practice, is soon reached. The most perfect steam-boat ever constructed, (the New York boat North Ame-

rica,) cannot move more than thirteen, or at most fourteen miles per hour, through the water. But on the railway this difficulty does not exist. The resistance of the air is trifling, and as to the friction against the road, it is so far from following the law of the resistance of fluids, that experiments prove it to be nearly if not quite independent of the velocity. That is, a carriage moving at the rate of twenty miles an hour, will be no more obstructed by friction, than one moving but five miles an hour. Upon this principle, it would seem as if no bounds could be set to the velocity that may be attained in a locomotive carriage, on a well constructed railway. To gain this advantage, however, it is evident that the carriage must not be drawn by horses, but must be propelled by some moving force not subject, like these animals, to a limit of speed. Such a force is presented in the steam engine, and accordingly this powerful machine has been employed, with great success, for the purpose in question.

The steam engine, as it is usually constructed, is a very heavy and cumbrous instrument. But when employed for transporting loads, it must itself be set in motion on the road, and hence a great difficulty in the way of its application as a locomotive engine. For this purpose, it must be reduced to its greatest simplicity. The condensing apparatus, which requires much room, and consumes a great deal of water, is dispensed with, and the steam, after having propelled the piston by its expansive force, is allowed to escape. The engine, too, should have a great power, with small dimensions, and hence steam must be employed of a high elastic force. In a word, the high pressure engine can alone be used; and its perfection, as a locomotive machine, depends upon its having the greatest possible power, with the least possible weight. The attention of engineers has accordingly been anxiously directed to the attainment of these conditions; with what success, we shall now see.

When a portion of the Liverpool and Manchester railway was completed, the directors of the company offered a reward of 500 pounds sterling for the best locomotive engine presented for trial, upon their road, within a given time. This premium, with the numerous advantages sure to follow to the sucessful candidate, produced a competition which has presented us with the most astonishing results.

Early in October last, five locomotive carriages were brought forward, by their inventors, for the great trial. These were

The Novelty, by Messrs. Braithwaite and Ericsson;

The Rocket, by Mr. Robert Stephenson;

The Sans Pareil, Mr. Ackworth;

The Cycloped, by Mr. Brandreth;

The Perseverence, by Mr. Burstall.

Of these, the Perseverence did not come up to the stipulation required by the directors; and the Cycloped, which was a sort of horse treadmill, did not at all answer the expectations of its projectors. The competition may therefore be considered as confined to the other three. In comparing them, we have three points to consider: weight,—fuel consumed,—and velocity of movement. The Mechanics Magazine states these particulars, as follows.

"I. The first point to which we have to attend, is the respective weight of the engines, since according to their weight must be the degree of friction which they have to overcome. For the reasons we have assigned in a previous number, there must be included in this weight the whole working power of the each engine, that is, the whole of the machinery and the whole of the materials necessary for putting and keeping it in motion; and, for the sake of greater clearness, we shall reduce this weight into pounds. Each engine is supposed to be fully equipped for a journey of 35 miles continuance.

| | Tons. | Cwts. | Lbs. | |
|---|---|---|---|---|
| 'The Novelty' weighed, according to the canal carrier's receipt, | 2 | 15 | 0 | |
| Add for water in the boiler, | 0 | 4 | 2 | |
| Water in the tank, | 0 | 11 | 12 | |
| Coke baskets and coke | 0 | 0 | 76 | |
| The three last items estimated by Mr. Vignoles. | | | | |
| | 3 | 10 | 90 | =7,930 lbs. |

| | Tons. | Cwt. | Lbs. |
|---|---|---|---|
| 'The Rocket,' according to the official list of the carriages entered for the competition, weighed | 4 | 3 | 0 |

| | | | | |
|---|---|---|---|---|
| The additional tender with its contents, was stated to weigh . | 1 | 13 | 0 | |
| | 5 | 16 | 0 | = 12,992 lbs. |
| 'The Sans Pareil' weighed, according to the same official list, . | 4 | 8 | 0 | |
| Add for tender and its contents, . . . | 1 | 13 | 0 | |
| | 6 | 1 | 0 | = 13,652 |

From this comparison it appears, that the working power of "The Novelty" weighs little more than one-half that of either of the other engines. It must of course have to that extent less friction to overcome, and do less injury to the rails. It may be supposed that as it weighs less, it will exert proportionably less power; but this is not the case; the area of the cylinder being nearly, and the pressure on each piston precisely the same, in all three engines.

"II. We have next to consider the *quantity of fuel* consumed by each engine.

The owners of "The Novelty" professed to be able to go one trip of 35 miles with 4 bushels of coke; and what they did perform leaves no doubt on our minds that this is a fair estimate of the quantity that would be required for such a distance.

The fuel consumed by "The Rocket" in performing its two trips of thirty-five miles each, was stated to be about half a ton.

Of the quantity which "The Sans Pareil" consumed in going its twenty-five miles, we have no exact account, but we have been informed that it was nearly as much as "The Rocket" required for performing double the distance. The different construction of the boilers of the two engines furnishes a sufficient reason for believing that "The Sans Pareil" must consume a great deal more fuel than "The Rocket;" and we shall not probably err much if we assume that the difference amounts to one-fourth more.

The quantity and cost of the fuel expended by each engine per mile, will, according to these data, stand as follows:—

| | PER MILE. Quantity. lb. oz. dr. | Cost. about |
|---|---|---|
| The Sans Pareil | 18 10 10 | 2 pence. |
| The Rocket | 14 14 14 | 3 halfpence. |
| The Novelty | 4 12 12 | 1 farthing. |

The saving of expense is not the only advantage gained by reducing the expenditure of fuel; there may be situations, indeed, where fuel is so cheap as to make any saving in this respect of no moment. A matter of far greater importance is the increased facility which is thus given to the employment of steam power for the accomplishment of long distances—at sea particularly. An engine which, like "The Novelty," is worked with two thirds less fuel than any other engine, will of course go three times the distance with the same quantity, and have only to stop once to take in a new supply, while the others have to stop three times.

A reduction so great as has been realized in the case of "The Novelty" was never before accomplished, nor ever, we believe, supposed to be within the limits of attainment. Mr. Gurney was thought to have done wonders, when it was announced that he only consumed half a bushel of coke per mile, at an expense of twopence; but here we have a mile performed with less than the fourth of half a bushel, at an expense of only one farthing!

"III. We now proceed to compare the *rate of speed* accomplished by the different engines.

"The Novelty" went on the second day of the competition, with three times its weight attached to it, 20¾ miles in one hour. The total weight moved, including the carriage, was about fifteen tons. In calculating the weight in this instance, no deduction was made on account of the engine's carrying its own water and fuel, but when prepared for its intended trials on the subsequent days of the competition, due allowance was made for this circumstance. The load then assigned to it by the judges was 6 tons 2 cwt. When it accomplished the trips recorded by Mr. Vignoles, the total weight moved including that of a number of persons on the engine and wagons, was only 10 tons 6 cwt. 1 qr.; and the speed which it then realized was nearly equal to twenty-two miles an hour. It will be observed, that though some increase of velocity was thus acquired, it was by no means proportional to the reduction of the weight; a circumstance which is doubtless to be ascribed to the very imperfect working order in which the engine was at the time of this second trial. When the weight drawn was reduced to

merely that of a wagon containing forty-five persons—equal to about three and a half tons—and the total weight moved to about nine tons, the velocity was increased to thirty and thirty-two miles per hour; a rate which, though unprecedentedly great, is still less than what the previous performances of this engine, with double that weight, might have warranted us to expect from it.

The total weight moved by "The Rocket" when it went the seventy miles continuously, was seventeen tons; and the greatest number of miles which it traversed in any one hour, was twelve and a half. Stripped of all weight, and carrying just as much *materiel* as would suffice for a couple of trips of a mile and a half each, it went at the rate of *thirty miles an hour*. Drawing a carriage loaded with passengers, it went at a velocity which sometimes reached twenty-four miles an hour.

The weight drawn by "The Sans Pareil," if calculated in the same way as that assigned to "The Rocket," must have been thirteen tons six hundred weight, (and not eighteen tons, as stated in our account of the sixth day's proceedings,) the total weight moved, seventeen tons fourteen hundred weight. The greatest speed which it accomplished in one hour was twelve miles and a half.

The superiority of "The Novelty" is least apparent in the instance of its drawing the least weight; but that, as we have before said, must have been owing to its being in a less efficient state on that occasion. Since "The Rocket" doubled its rate of speed when it had only a carriage and passengers to draw, we can see no reason why "The Novelty" should not have done the same had its machinery continued in an unimpaired state."

Since the experiments were made which led to the above comparison, the Novelty has been subjected to a more fair and satisfactory trial. The following account of it is given in a letter from Liverpool, dated December 17, 1829.

"The anxiety universally entertained by the people here to see their favourite, "The Novelty," again at work, has been at length partially gratified. Having undergone a thorough repair at Messrs. Fawcett and Co.'s factory, and been privately proved there in various ways, she made her reappearance this morning on the rail-way, under the charge of Mr. Ericsson, and has been going *the whole day* with the greatest success: no accident or interruption of any kind (as far as regards the engine) occurred. She travelled sometimes with, some without passengers, and at various speeds, generally *from twenty-five to thirty-two miles per hour*. The bearings most liable to be affected by this rapid speed, namely, the crank-couplings, the eccentrics, and the axle-tree brasses, *were not once oiled*, from the time the carriage began working till the conclusion of the day's operations. Nothing can be conceived more beautifully smooth than the entire action of this carriage; all its parts worked in admirable harmony with each other. The steam appeared to be got up and kept up at the requisite pressure, with the greatest ease, and at a wonderfully small expense of fuel. The spectators, who were at one time very numerous, were much delighted, and repeatedly testified their admiration by loud cheers. But that the rail-way shares have already reached so high a premium, (about 80 per cent.!) as scarcely to admit of any further advance, I should not be surprised to see them take another start to-morrow. '*The Rocket*' has been also doing wonders in the way of speed; but the superior compactness, steadiness, and elegance of "The Novelty," combined with even the same speed as "The Rocket," would be sure to procure for it a decided preference. In order to prove *the power* as well *as speed* of the engine, a number of loaded wagons were attached to it; but by this time it was becoming dark, and the distance performed was not sufficient to furnish any satisfactory result. The experiments will be probably resumed to-morrow, or in a day or two after, when I shall again write you all about them."

Of this subsequent trial, the same correspondent gives the following notice, in a letter of the 21st of December.

"I am just returned from Rainhill, and have but time, before the departure of the post, to acquaint you briefly with the results of another long day's experiments with "*The Novelty*." It drew for several hours a gross weight of *thirty-five tons*, that is at least ten times its own weight, at the rate of *twelve miles per hour*!!!. Can it now be doubted that this is as efficient an engine for weight as for speed?"

Without the aid of diagrams, it would be impossible for us to give an intelligible description of the locomotive engines used in this wonderful race. We have already stated that they were all of the high pressure kind. The peculiar principle which has given to the Novelty its great superiority in lightness and force, is that the fire is urged by a blast of wind from a bellows worked by the engine itself. This engine was decidedly the best on the ground, in every respect; yet on account of an accident that happened to it on the day of trial, it had to be withdrawn from the competition, and the premium was awarded to the Rocket, of Mr. Stephenson. Thus the Rocket gained the prize,—but the Novelty gained the victory.

R.

## THE FULTON FUND.

We have been gratified to find that the scheme proposed by one of our correspondents, to obtain, at last, for the heirs of Fulton, some remuneration for the invaluable benefits which he has conferred on the country, has been copied into many papers of the widest circulation and influence, and seems to have met with general approbation. We subjoin an extract from the Political Arena, which shows that at least one attempt is already made to carry the project into execution. We sincerely hope that it may succeed, and may be imitated. †

"The attentive reader will recollect that we gave some time since, a brief sketch of an article which appeared in the Virginia Literary Museum of the 7th ult. in which the narrow circumstances of Fulton's heirs were mentioned as a reproach to the nation which gave him birth, and which is now daily and hourly enjoying incalculable advantages from the intense and unwearied efforts of his daring and irresistable genius.

"The writer of the above article suggests.

1. That the proprietors of each boat provide a box to receive contributions for the benefit of Fulton's heirs.

2. That every passenger be invited, without importunity, to contribute one cent.

3. That one cent of the passage money of every passenger, who may not choose to contribute, be set apart to supply the deficiency.

4. That the proceeds thus contributed be remitted on the first day of every month, or as soon after as practicable, to the Bank of the U. S., at New York, on account of Fulton's children.

In this way a liberal provision may be made, without being felt by any body, for the family of one of the greatest, if not the very greatest, of our public benefactors. Had Fulton been a subject of the Emperor of Russia, he had probably been enobled, and certainly enriched. Had he been a subject of Great Britain, he would have experienced the bounty both of king and parliament; and being a citizen of our republic, there seems to be a peculiar fitness and propriety that the reward of his useful labours should be bestowed by *the people*. Such a spontaneous act on their part would be honorable to the character of the nation, both for intelligence and liberality.

The foregoing piece became the subject of conversation among some gentlemen on board the Patuxent, on her way to this place, on Friday last, when Messrs. James M. Garnett, Joseph C. Cabell, Augustine Neale and John Waring determined to present a box to the new Steam-Boat Rappahanock, with a request that she might be the first to try the experiment. The box was accordingly made and the next morning presented; all the proprietors who could be met with, expressing much gratification at having an opportunity to set so praiseworthy an example.

It is confidently hoped, that not an individual will be found in the U. S., unwilling to contribute so small a pittance towards the accomplishment of this laudible and benevolent object. The box has the following inscription:

ONE CENT BOX.
LET INDIVIDUAL GRATITUDE
COMPENSATE FULTON'S HEIRS,
FOR NATIONAL NEGLECT."

## AN INVENTORY OF FURNITURE OF THE 15TH. CENTURY.

"The seconde part of the Inventorye of our late sovereigne lord Kyng Henry the Eighth, conteynynge his guardrobes, houshold-stuff &c.—HARL. MSS.

The following account of the furniture of a closet at Greenwich in the reign of Henry VIII. (A.D. 1500) will afford some idea of the manners and customs of the period.

A clocke.
A glasse of steele.
Four battell axes of wood.
Two quivers with arrows.
A painted table.
A payre of ballance with waights.
A case of tynne with a plot.
In the window.—
A round mapp.
A standinge glasse of steele in ship—

A branche of flowres wrought upon wyre.
Two payre of playing tables of bone.
A payre of chesmen in a case of black lether.
Two birds of Araby.
A gonne upon a stocke wheeled.
Five paxes of glasse and woode.
A tablet of our Ladie and Saint Anne.
One payre of bedes of jasper garnyshed with lether.
A globe of paper.
A mappe made lyke a scryne.
Two greene boxes with wrought corall in them.
A standing glasse with imagery made of bone.
Three payre of hawkes gloves, with two lined with velvett.
Three combe cases of bone furnished.
A night cappe of black velvett embrawdered.
Sampson made in alablaster.
A piece of unicorn's horne.
Littel boxes in a case of woode.
Four little coffers for jewels.
A horne of ivorie.
A standynge diall in a case of copper.
A horne-glasse.
Eight cases of trenchers.
Fortyfour dogs collars of sondrye making.
Seven lyans of silke.
A purse of crymson satten embrawdered with golde.
A round painted table with th' ymage of a kinge.
A foldinge table of images.
One hundred and thirty eight hawkes hoodes.
Two boxes covered with black velvett.
A reede tipt at both ends with golde and bolts for a turony (Tyrone ?) bowe.
A chaire of joyned worke.
An elle of synnamounde (cinnamon) sticke typt with sylver.
Three ridinge roddes for ladies, and a yard (rod) of blake tipt with horne.
A blake sattenbag with chesmen.
A case of fyne carved work.
Two long cases of blacke lether with pedegrees.
A table, with wordes of Jhesus.
Six walkyng staves, one covered with silke and golde.
A table with a cloth of Saint George embrawdered.
A box with a bird of Araby.
A case of Irish arrows.
A target.
Twenty nine bowes.

In the *gallery* of Greenwich mention is made of a "mappe of England;" and in Westminster Palace "a mappe of Hantshire," a proof that the topography, of England at least, was studied at this period. Among various heads of furniture or stores, at the castle of Windsor such as *horns*, *gyrdelles*, *hawkes hoods*, *weapons*, *bucklers*, *dogs collars* and *aiglettes*, *walking staves* are specified. Under this last head there is "a cane garnished with sylver and gilte, with astronomie upon it. A cane garnished with gold havinge a perfume in the toppe, under that a diall, with a pair of twitchers, and a paire of compasses of golde and a foote reule of golde, a knife and the file, th'afte (the haft) of golde with a whetstone tipped with golde &c."

*

## ENGRAVING IN FRANCE.

It has been for some time remarked, that whilst proper encouragement was given in France to painters, the art of engraving was suffered to remain stationary, or rather to lose ground. The demand for splendidly illustrated English Annuals, however, has piqued the *amour propre* of the French, and induced them to make an attempt to place the art upon a more respectable footing. For this purpose a society has just been formed by subscription, with a capital of 200,000 francs, to order engravings from promising artists, which are to be disposed of by the society, and to distribute rewards and medals. The King, and other members of the royal family, patronise this institution.

*

## SCHOOL.

THE Undersigned proposes to open a School in the neighbourhood of the University, to commence on the 1st Monday in September, and terminate on the 1st Monday in August, with a vacation of one month in the middle of the session.

The course of instruction will embrace the ordinary branches of an English education, the Latin and Greek languages, and Mathematics.

*Terms.*—For the English branches of education alone, for a session of 10 months, $30
For Ancient Languages and Mathematics, . . . . . 40

The French language will be taught, if required, at a moderate extra charge.

The plan of instruction will be made to conform, as much as possible, with that pursued in the University, with which the undersigned has made himself familiar in the course of several years spent in that institution; but, as that plan is only adapted to those more advanced, it may not be improper to present a brief outline of the course he intends to pursue with *beginners*. The scholar who is commencing the study of the *Latin* language will of course begin with the grammar, but will not be required to overburden his memory with rules and other matters which he cannot possibly comprehend, and which are often the source of a deep rooted disgust for the study of the Ancient Languages. He will be taught the declensions of nouns, adjectives, and pronouns, the conjugation of verbs, &c., partly by committing to memory the examples in the grammar, and partly by writing off for himself numerous examples of other words similar in their declension and conjugation. When he becomes familiar with these, he may commence reading; but instead of those *modern Latin* authors or translators which are commonly read, a good classic author will at once be put into his hands—*Cæsar's Commentaries* for example—which will be equally easy, and infinitely more improving. The teacher will here find it necessary, at first, to read over small portions of the author, and explain, in a familiar manner, whatever he thinks is not beyond the capacity of the scholar. The rules of syntax will be explained and illustrated by numerous examples, until they are indelibly impressed upon his memory: and he will not only be required to observe these rules as they occur in the course of his reading, but will be exercised in constructing sentences according to them. In this way he will form correct ideas of the nature of language and its principles of construction, and finding that a *rule* is nothing more than the expression of some circumstance in which a number of particular instances agree, he will gradually be enabled to form them for himself, and will thus learn the first lesson of a judicious education, which is to think, to discriminate, and to enquire.

A similar plan will be pursued in *Greek*. Instead of the Testament, which (as is well known) is not pure Greek, he will commence the *Anabasis* of Xenophon.

A strict attention will be paid, from the beginning to the correct pronunciation of these languages, which is of much more importance than most persons imagine, and is almost impossible to be acquired after habits of corrupt pronunciation are once formed.

After reading a sufficient quantity of *Xenophon* and *Cæsar*, he will read, if there be time, a play or two of *Euripides*, and parts of *Virgil* and *Horace*, and will then be taught the most common metres in *Greek and Latin Prosody*.

While reading these and other authors, he will be required to make himself acquainted with the history of the author's times, and will have his attention constantly directed to the information necessary to a full understanding of what he reads, whether it relates to *History, Geography, Mythology*, or *Antiquities*. Ancient Geography will also be taught separately by means of a text book. *Written translations* from these languages will be continually required of him, both as a means of enabling him to understand better what he reads, and of improving him in his own language.

In *mathematics*, the text books used will be Lacroix's Arithmetic and Algebra, with numerous examples from other books.—Legendre's Geometry—Lacroix's Trigonometry—and, (if any wish to continue the study,) Boucharlat's Differential and Integral Calculus.

Arrangements will be made for the accommodation of pupils from a distance. It is indeed contemplated to establish a regular boarding-school, at a large and commodious building between the University and Charlottesville, where the most approved modern system will be introduced, and unremitted attention be paid to the moral and physical education of the pupil. Should this plan be determined upon, the particulars will be communicated to the public, in a future advertisement.

Persons desirous of entering students in this school will please to make application as early as possible. Letters addressed to A. S. Brockenbrough, or to the undersigned, at the University, will be attended to.

HENRY TUTWILER, Jr.

*University of Virginia, May* 20th. 1830.

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*University of Virginia.*

Mr. Henry Tutwiler has attended the University of Virginia for five years: during which time he has graduated in the schools of Antient Languages, Mathematics, Moral Philosophy and Political Economy, and is a candidate for graduation, at the end of the present session, in the schools of Natural Philosophy and Law.

During the whole of his residence at this Institution his deportment has been most exemplary; and his habits of study, capability of receiving instruction and positive attainments have been such as to obtain for him the highest approbation of the Professors and their warmest interest in his future success.

Mr. Tutwiler's qualifications entitle him to the support of the public in any sphere in which he may be disposed to exert them.

ROBLEY DUNGLISON,
*Chairman of the Faculty.*

May 20th. 1830.

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TO SUBSCRIBERS.

Those gentlemen who have encouraged the Museum by subscribing to it are earnestly requested to remit the amount of the year's subscription by mail to Mr. William Wertenbaker, the agent, *at the University.*

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